Radiological Emergency Management System (REMS)

Project Goals

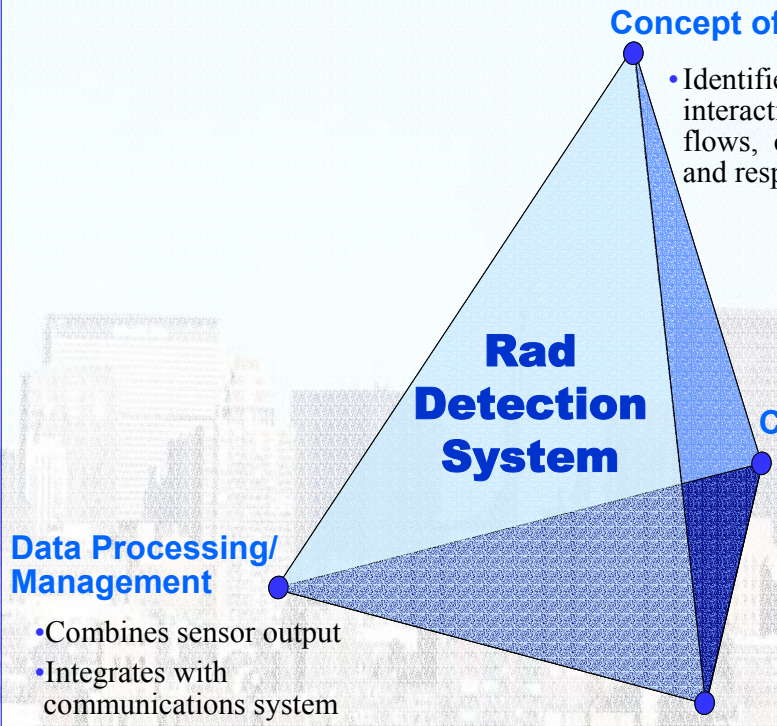
Through systems analysis & pilot deployments, develop supporting information to utilize sensor networks that enhance our Nation's radiological/ nuclear incident management capabilities

- Establish operational prototype for radiation sensor networks in NYC & NY/NJ metro area
- Generate database of "normal" background levels
- Transition technology to first responder community

Networked Radiation Sensors for Incident Management-Benefits

- *Single* picture of threat during time of weakest coordination
- Critical knowledge *before* responders enter attacked area
- Information needed to predict atmospheric plume trajectory
- Timely, authoritative, accurate information for rapid, efficient, effective response (increase public cooperation, avoid panic, minimize disruption, facilitate recovery)

Components of a Radiation Detection System



Concept of Operations

- Identifies functions, processes, interactions, information flows, concerned actors, roles and responsibilities

Communications

- Transmits data from sensors to command centers
- Displays information in clear, user-friendly format
- Provides decision-makers with information required to act

Data Processing/ Management

- Combines sensor output
- Integrates with communications system
- Identifies isotopes
- Discriminates real threats from benign conditions

Sensors

- Detects radiation

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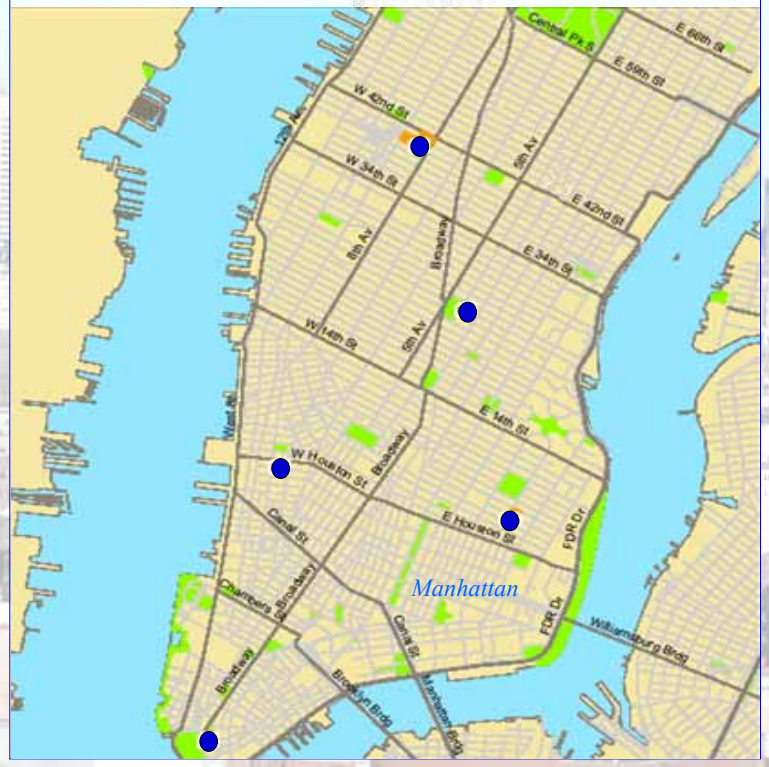
Sites for Radiation Detectors in New York City

EML and the New York City Office of Emergency Management (OEM) are collaborating to select sites (nodes) for locating radiation detectors, involve regional public and private partners, develop a concept of operations, and share radiological data. Three sites are currently operating in Manhattan. Real-time data is transmitted 24/7 to OEM. Two additional sites are planned.

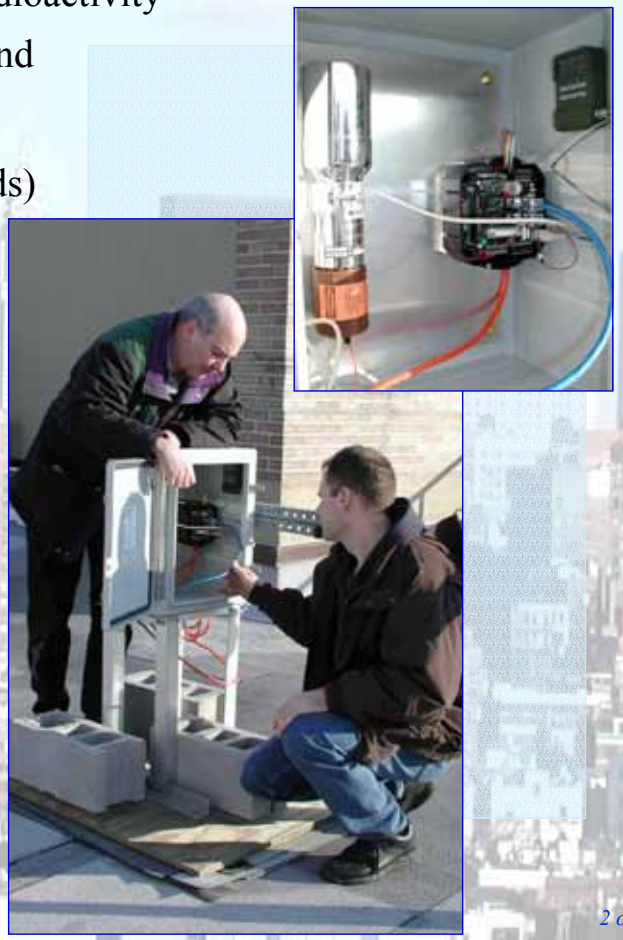
GIS-Based Data Display (example)



Comprehensive Radiation Sensor (CRS)

The CRS is a real-time gamma radiation detector and spectroscopic analyzer developed by EML. It is the radiation detector being used in REMS.

- Provides spectral data in addition to total gamma radiation, allowing identification of specific radionuclides and discrimination between natural and man-made radioactivity
- High sensitivity and rapid sampling cycle responds quickly (in seconds) and provides near real-time information on atmospheric radiation levels
- A prototype CRS has been in continuous operation on the roof of EML's building in lower Manhattan since November 2001



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Data Transmission

A reliable data transmission system is a critical part of the radiation detection system. The data transmission system sends data from detectors located in the field (Manhattan) to one or more data/command stations.

Data from each CRS detector is collected, compressed, encrypted, and labeled with site identification and time-of-day headers. A communications subsystem computer then selects one of three data communications technologies: Internet (default), cellular telephone, or geosynchronous satellite, to send the data packet to a secure data center. The data center computer examines the site data and stores the information in a file. The file data is then "pushed" to a server located at the data/command station. This server receives, decrypts, analyzes, and displays the collected data.

CRS Gamma Spectrum (typical)